40. **A German Formula.** Take one ounce of alum and one ounce of white garlic juice. Write with a quill and upon heating the paper the letters becomes very legible and can not be removed by salt water application.

41. A late formula is to use alternately two chemicals in code work. A figure is written in cobalt chloride solution and the next figure is written with platino-cyanide solution. Moisture will bring out the second and heat will bring out the first.

42. **Disappearing Ink.** Take a weak solution of starch, tinged with a little tincture of iodine. This bluish writing will soon fade away.

43. Writing done with a solution of ammoniacal solution of silver nitrate will be made legible by exposing the writing to the sunlight.

44. **How to make microscopic writing on a 2-cent red U. S. postage stamp.** Take a crow quill pen, write with orange colored drawing ink very thin finely shaded letters across the face of the stamp. To read the writing on this stamp, interpose a ruby glass on the stamp, which will make the stamp invisible and the writing legible.

45. Examine fruit leaves, palmettos, etc., for writings cut with knife or other sharp points.

46. Messages are painted on the human body with invisible ink. To make them appear, develop a suitable reagent sprayed with an atomizer. To destroy messages, the body should be scrubbed, and then wash with lime or lemon juice, to eradicate all tracings or markings.

47. Letters, circulars and leaflets can be photographed without the camera by contact on a photographic sheet of paper, exposed and subsequently developed and fixed, and made to disappear with bi-chloride of mercury solution and made to reappear by dipping paper in hypo solution. Of course, the original writing or printing must be on one side of the paper only.

48. Suspect freshly-painted metal walls on ships, etc. Often, freshly-painted surfaces cover communications scratched on the underlying metal surfaces, which communications are made legible by the removal of the thick paint, by the use of turpentine, etc.

49. Type-written sheets, printed music, printed newspapers and pamphlets, should be carefully scrutinized for invisible writing. Examine suspected paper in sunlight; if any traces or suspected markings are noticeable, resort to the heat test, or get an expert's aid.

50. There are a number of other methods used by spies and smugglers, according to the skill and education of the criminals, such as placing writings under postage stamps, wrapping messages in medicine capsules, and engraving messages and credentials on toe-nails, which latter are made visible with powdered charcoal.

The rule is to suspect and examine every possible thing. The war between the spy or forger and the expert is continually bringing out new methods.

Printed by the San Francisco Division for the information of Post Office Inspectors. 1311

INVISIBLE PHOTOGRAPHY AND WRITING, SYMPATHETIC INK, ETC.

CONFIDENTIAL. **NOT FOR PUBLICATION.**

Information Compiled By THEODORE KYTKA, Handwriting Expert, San Francisco, Cal.

Invisible Photographs of writings and printing.—Make a silver print, fixed and bleached in mercury chloride. To make visible, dip in hypo.

1. **Sympathetic Ink**—Chloride of Cobalt—bring out with heat.
2. Cobalt acetate and saltpeter—(heat).
3. Cobalt Chloride and nickel chloride mixed—(heat).
4. Nitric Acid—(heat).
5. Sulphuric Acid—(heat).
6. Sodium Chloride—(heat).
7. Saltpeter—(heat).
8. Copper Sulphate and ammonium chloride—(heat).
9. Silver Nitrate—(expose to sunlight).
10. Gold tri-chloride—(sunlight).
11. Ferric sulphate—(bring out with infusion of gall-nuts or ferro-cyanide of potassium).
12. Copper sulphate—(bring out with ferro-cyanide of potassium).
13. Lead vinegar—(bring out with hydrogen sulphite).
14. Mercuric Nitrate—(bring out with hydrogen sulphite).
15. Starch water writing—(bring out with tincture of iodine or re-sublimate of iodine wafers). (fumes)
16. Cobalt nitrate—(bring out with oxalic acid).
17. Soda lye or sodium carbonate—(bring out with phenol phthaleine).
18. Starch writing on linen, after it becomes dry, is made visible by fumes of iodine or by solution of potassium iodide. The writing becomes blue and disappears again by washing paper with a very weak solution of hypo sulphate of soda.
19. Letters written with a weak solution of the soluble chloride of platinum or iridium develop black when fumed with mercurial vapor. This ink is used for marking linen and is called indelible. This ink is sold in large bottles to laundries, etc. It is often used for smuggling information across the frontier, when the writing is put on handkerchiefs, shirts, underwear, or on paper surfaces.
20. Sulphate of copper, much diluted, used in writing with a soft tooth pick between printed lines. This is developed by fumes of strong ammonia, which makes the invisible writing appear bluish.

EXEMPT from Declass. Per E.O. 12065, Sec. 3.4 Re-review - 1999

C01121945

APPROVED FOR RELEASE DATE: 31-Mar-2011

C01121945

21. Soluble compounds of antimony will develop red writing by the use of hydrogen sulphite vapor.

22. Soluble compounds of arsenic or peroxide of tin will develop yellow writing by use of hydrogen sulphite vapors.

23. Diluted acid solution of iron chloride. Invisible writing will appear red by sulpho cyanide vapors and will disappear again upon fuming with vapors of ammonia.

24. Write characters on steel plate, wood, or any polished surface or on a smooth papered wall, with a thin solution of paraffine dissolved in benzol. Use fine stiff brush or coarsely pointed goose quill or fountain pen. Upon evaporation, writing becomes invisible, paraffine being transparent. To develop it, use finely powdered graphite on light background and finely powdered dragons-blood or aluminum dust, such as used by fingerprint experts, for dark background, such as on steel safes, carving knives or covers of tin bread boxes, etc. In every instance use two fine long camels hair brushes—One should be round, about ¼ inch thick, with long hairs, for powdering, and the other brush should be about an inch broad—a regular photographic camels hair brush, for cleaning up surplus powder.

25. Dip a tooth pick in common milk and write between lines of an ordinary letter. The writing will appear by being ironed out with a hot flatiron.

26. Write with a quill, with the following solution: Dissolve one part of lead salt, one part of uranium acetate and the same quantity of bismuth citrate in 100 parts of distilled water; then add, drop by drop, a solution of sal ammoniac until the solution becomes transparent. Afterwards, mix with few drops of gum arabic. To bring out this writing, expose paper to fumes of sulphuric acid. The writing appears dark brown and after fifteen minutes or more the writing disappears, but it can be made legible again by brushing the letter with a 2 per cent to 5 per cent nitric acid solution.

27. Writing on white paper with a common ordinary writing ink containing tanno gallic ferric base, using a quill, tooth pick, match or rounded fountain pen, can be made to disappear with the common ink erasers now in the market, such as Stanfords, Carters, etc. Such decolorized writings can be again made readable by the application of hydro sulphurett of ammonium; Mr. Kytka has restored erased figures after a lapse of twenty years. This method is used by forgers such as Karl Becker, and to alter names and dates in passports.

28. Pencil erasures and the surrounding disturbed paper surface can be made visible by the fumes of resublimate of iodine.

29. Writing with a very weak solution of chloride of cobalt can be made visible by the heat of the human body, or ordinary heat from a stove or flatiron. Upon cooling the writing again disappears.

30. Suspect printed black ruled lines such as sometimes border a page or divide columns. These lines are used by writing messages on them in the Morse code (dots and dashes) with a transparent solution of gum, or the white of an egg beaten up with six ounces of water. For developing, heat paper slightly and powder with finely powdered dragons blood. The code will appear in red dots and dashes on the black lines.

31. Counterfeit stamp impressions are made by the photo-zincographic process. They can be made very close fac-similes, so as to deceive the examiner.

32. On all documents and passports, examine ink, holding the document against the direct sunlight and then any variation in the color of the ink is noticed in the magnifying glass.

33. **Steel die impressions** are easily imitated by photographing the seal impression, on a large scale, say about six inches in diameter. A plain silver print is made from this negative. The artist inks up this photograph with Higgins waterproof ink. Subsequently the photograph is dipped in a solution of cyanide potassium, which makes the photograph disappear and leaves a perfect drawing of the seal on an enlarged scale. The zincographer reduces this photograph to the exact size of the genuine seal on the metal, which, in turn, is etched. The resulting male and female metal plate of the die is mounted on a stand for making impressions. This method was shown me by Sir Harry Cooper, the noted English forger, from Australia.

34. A solution of common table salt or urine is often used by convicts in prison, to write between the lines of a letter, with a match. The confederate heats the paper to make it legible.

35. **Photography** is used as follows: A film negative is made of letters, plans, etc., on a reduced scale, but the film is not developed. It is then placed in a transparent celluloid envelope and this envelope is placed between wooden boards, or bound in book-covers. On reaching its destination, the confederate developes the film and makes suitable enlargements therefrom. To the uninitiated, who would open the box in the daylight, the transparent gelatine envelope would destroy all chance of disclosure.

36. **German Secret Ink.** Take one ounce of linseed oil, 20 ounces of liquid ammonia, 100 ounces of distilled water. This mixture must be well shaken up before using with a quill pen. Write in free space between the words written in pencil. To make this writing appear, dip the whole letter in cold water, and read secret writing while wet. Upon drying the writing disappears, but upon redipping in water, it will reappear again.

37. **Vanishing Ink.** Readable only for twenty-four hours after writing. To make: Boil nutgalls in alcohol, add Roman vitriol sal ammoniac. When cold dissolve a little gum in it. Use quill or blunt pointed fountain pen—a steel pen leaves too many pen-point furrows.

38. Writing made with vegetable or fruit juices, such as onion, leek, artichoke, cabbage, lemon, etc., becomes visible by being ironed with a hot flatiron.

39. Take an unexposed sheet of bromide paper, fill a fountain pen with Neparn solution; (used for developing bromide papers) write your communication with the fountain pen—of course, this must be done in a darkroom, under a ruby lamp, allow the writing to become dry on the paper, fix the print in hypo, wash and allow to dry, dip the print in strong solution of mercury chloride, which will completely eliminate the writing and leave a white sheet of paper. Upon dipping the sheet in a weak solution of hypo, the writing will appear again in a permanent state.